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SUBJECT: SOUTH AFRICA: STATE OF ALUMINUM INDUSTRY

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Summary

1. (U) The South African aluminum industry is well developed and a major contributor to the economy. During 2005, primary and semi-fabricated aluminum sales amounted to 920,000 tons valued at about \$1.7 billion, of which exports accounted for more than 70% by mass and value. All plants are currently working at full capacity and plans are in place to expand production after 2010, contingent upon electricity generation capacity simultaneously expanding to keep pace with rising demand. Local downstream manufacturers provide for nearly all the various market sector requirements. Aluminum smelters and fabricators both have active workplace programs to encourage testing and treatment of HIV/AIDs for infected and affected employees.

2. (U) Additionally, local smelters provide most of the alloys required by the automotive, building and construction, engineering and fabrication, mining, packaging, and transport sectors as well as for the wheel and cable industries and a variety of other niche industries. Where local demand for special alloys and/or semi-fabricated products cannot be met, these are imported. Expansion opportunities exist for local consumption in niche areas and in the automotive industry, and for export of ingot and semi fabricated products, also for the automotive industry. However, there is concern about whether exports can remain competitive, given rising input costs, a volatile currency and the availability of the requisite skills. On the local demand side, threats are posed by cheap imports from China and other Far East exporters. End Summary.

Aluminum Metal

3. (U) Aluminum metal has a unique combination of properties that make it one of the most versatile materials for a variety of applications. It is a strong light metal used extensively in the packaging, automotive, electrical, engineering, construction, metallurgical, and chemical industries. The addition of small quantities of other metals (the major alloying metals are manganese, copper, zinc, magnesium, and silicon - a wide range of secondary alloying elements as also added to tweak characteristics), together with a variety of temperature and mechanical treatments (cold - strain hardening - and hot - solution heat treatment) enable metallurgists to impart specific properties required for different applications. In addition to the core markets products like aluminum powder, flake and paste products are used in explosives, rocket fuel, metallurgy, chemicals, inks, and decorative materials.

4. (U) Aluminum is a light highly reflective metal with a density equal to about 35% that of steel and 30% that of copper.

Nevertheless, some of its alloys have strengths greater than structural steel and are highly corrosion-resistant under most service conditions. Aluminum is non-toxic, non-magnetic, non-sparking, has good electrical and thermal conductivities, can be easily worked into any form, accepts a wide variety of surface finishes and does not become brittle under extreme low temperatures. It has a relatively low melting point and cannot be used where strength is needed at high temperatures - practical sustained performance is limit to 200-300 degrees Fahrenheit.

15. (U) A major feature of aluminum is its ability to be recycled and some 50% of annual production is from recycled material. Scrap can be transformed into aluminum metal using about 5% to 7% of the electricity used in the original alumina-to-metal conversion with all the attendant benefits attributable to energy saving and recycling of an otherwise waste material. There is no difference between primary and recycled aluminum in terms of quality or properties.

Aluminum Production

16. (U) Aluminum ore, most commonly bauxite (a weathered clay with a high aluminum content), is relatively plentiful in tropical and sub-tropical areas of Africa, the West Indies, South America and Australia. Some deposits also occur in Europe. Bauxite is refined into an aluminum oxide (alumina) and then electrolytically smelted to the metal. The basic meta-production unit is known as a 'pot' in which one to three tons of metal can be produced per day. Pots are usually assembled in rows known as 'potlines' that contain up to 250 pots.

17. (U) Primary aluminum production facilities (to produce aluminum metal) are located in many parts of the world, particularly where there is sufficient inexpensive energy available (hydro-electric, coal, natural gas or nuclear) - some 50% of aluminum is powered by hydro, 36% by coal, 9% by natural

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gas, 5% by nuclear, and less than 1% by oil. Based on 50% alumina content two tons of bauxite produce one ton of alumina (at 1,100 degrees C) and about two tons of alumina produce one ton of aluminum metal (smelted at about 900 degrees C, but once formed has a melting point of only 660 degrees C). In the case of coal-generated electricity, some eight tons of coal (dependent on the heat content) produce one ton of metal. The production of metal from alumina is highly energy-intensive requiring on average 15.7 MW-hours to produce a ton of metal. Thus, a smelter the size of Hillside (700,000 annual tons) requires a supply of some 1,000 MW of electricity.

18. (U) The basis for all modern primary aluminum smelting is the Hall-Hiroult Process, [HYPERLINK "http://www.world-aluminium.org/history/index .html"](http://www.world-aluminium.org/history/index.html) invented in 1886. Inputs to the process include: alumina, cryolite (sodium aluminum fluoride), a carbon- or graphite-lined steel container (the pot) that acts as the cathode (negative), large quantities of electricity at low voltage but very high current - typically 120,000 to 150,000 volts and 354 amperes - and a carbon anode (positive) made of petroleum coke and pitch and consumed at the rate of 400kg/ton of aluminum. During the process molten aluminum is deposited at the bottom of the pot and is periodically siphoned off, taken to a holding furnace where alloying metals may be added, cleaned, and then cast into the required shape.

19. (U) The smelting process is continuous. A smelter cannot easily be stopped and restarted. If production is interrupted by a power supply failure for more than four hours, the metal in the pots may solidify, requiring an expensive rebuilding process. Most smelters produce aluminum of 99.7% purity, which is acceptable for most applications. However, super purity aluminum (99.99%) is produced for some special applications, typically those where high ductility or conductivity is required. The marginal difference in the purities of smelter

grade and super purity aluminum results in significant changes in the [HYPERLINK](http://www.world-aluminium.org/production/processing/properties.html) "http://www.world-aluminium.org/production/processing/properties.html" properties of the metal.

Aluminum Processing and Uses

¶10. (U) Aluminum can be alloyed with other metals to make a variety of products with different properties. The main alloying metals are manganese, silicon, zinc, copper and magnesium but other metals are also used. Aluminum can be rolled into plate, sheets, or wafer thin foils half the thickness of a human hair. The rolling process changes the characteristics of the metal, making it less brittle and more ductile. Aluminum can be cast into an infinite variety of shapes; extruded at about 500°C to form intricate shapes and sections; forged by hammering to make stress-bearing parts for aircraft and internal combustion engines; and joined by welding, adhesive bonding, riveting or screwing. In general, the properties of aluminum alloys can be modified either through solution heat treatment or strain hardening and mechanical working (rolling and drawing), and its appearance can be modified by various surface treatments.

The South African Aluminum Industry

¶11. (U) The South African aluminum industry has no indigenous supply of aluminum ore of which bauxite, an aluminum-rich leached clay found mainly in a tropical belt around the equator, is the major raw material. While there are known deposits of bauxite in many parts of the continent they remain relatively under-explored and the only producer of any consequence is Guinea. South Africa imports raw material in the form of processed bauxite or aluminum oxide (alumina) mainly from BHP-Billiton's (BHP-B) plants in Australia and Brazil.

¶12. (U) The industry also imports other inputs to the process, including petroleum coke (from the US Gulf and BP refinery), pitch and aluminum fluoride. Two primary metal smelters and four semi-fabricators are the cornerstone of the South African aluminum industry and provide the basic inputs to numerous local downstream manufacturers. Locally manufactured products ensure that South Africa is virtually self-sufficient in its aluminum requirements. Specialist products are imported where necessary. The country has a thriving and growing export trade in primary metal and in semi-fabricated and final aluminum products - some 90% of overall aluminum production is exported. Aluminum has wide and growing applications across most of the countries industrial sectors.

Primary Metal Production

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¶13. (U) Africa has five aluminum metal producers, South Africa (900,000 tons), Mozambique (505,000 tons), Egypt (244,000 tons), Cameroon (90,000 tons) and Ghana (13,000 tons) - the latter two probably from scrap metal. South Africa has two smelters that together produce about 900,000 tons per year of primary aluminum metal at 99.97% aluminum content. These are located on the east coast of KwaZulu/Natal at Richards Bay, about 200 kilometers north of the city of Durban. Both are wholly owned and operated by BHP-B, which is the biggest diversified mining company in the world.

¶14. (U) The region hosts a third smelter at Maputo in Mozambique, which lies about 150 kilometers north of Richards Bay. The Mozal smelter has a capacity of about 506,000 tons per year of aluminum metal, all for export. It is also operated by BHP-B, but ownership is shared between BHP-B (47%), South Africa's state-owned Industrial Development Corporation (24%), Mitsubishi Corporation (25%), and the Government of Mozambique (4%). The three smelters contribute 84% of BHP-B's world-wide primary aluminum production and 4.4% of global output. Should the mooted plant expansions and new 500,000 to 600,000 ton per year Alcan plant at Coega materialize, this proportion would

increase to about 6.4%. Our BHP-B interlocutors noted that among the BHP-B smelters, Mozal was the most cost-effective and most likely to be expanded.

¶15. (U) The South African smelters, Bayside and Hillside, are separate and different in technology and output and currently produce above design capacity (as does Mozal). Output from the smelters include rod casting used by the electrical and steel industries, rim alloy bar used in the manufacture of wheels, extrusion billet for architectural and engineering profiles and for tubing, ingots for remelting and casting, and rolling slabs for milling into flat products such as sheet, plate and foil. Some 70% of smelter output is exported and, similarly, 70% of downstream products are exported as value-added products.

¶16. (U) Bayside (previously Alusaf) supplies the bulk of the common alloys required by the local semi-fabricators such as extruders, rolling mills and casters. It is the older of the two smelters and was established in 1969 as a so-called border industry to provide employment to the apartheid Bantustan (homeland) population. Its design capacity was 50,000 tons per year of aluminum metal. Ownership of Alusaf was shared between the state-owned Industrial Development Corporation (30.7%), the Swiss aluminum company Alusuisse (23%), and Gencor, the forerunner to BHP-B (46.3%). First metal was poured in 1971 and since then the smelter has been expanded to the current annual design capacity of 180,000 tons. While Bayside's annual production is more than 200,000 tons, it also imports some 80-140,000 tons of liquid metal from Hillside. Because it was initially South Africa's only aluminum smelter, it was designed to produce a wide range of products for input to downstream industries.

¶17. (U) Bayside products include rod for electrical conductor applications and for de-oxidizing steel, billets for the extrusion sector, rim alloys for wheel manufacturers (40,000 tons per year), and rolling ingots for slab, sheet and foil producers. Bayside also has its own anode casting facility for the manufacture electrodes to supply power to aluminum pots. All Bayside's output goes to local semi-fabricators. In 2005, the semi-fabricator's produced some 260,000 tons of value-added products of which 70% was exported.

¶18. (U) Plans to expand Bayside's capacity to 250,000 tons are awaiting the availability of a guaranteed supply of power. South Africa's 4% growth in power demand has impacted on Eskom's (power utility) ability to guarantee an uninterrupted supply of electricity. The smelter currently requires a 350 MW electricity supply. Bayside's expansion capability is limited by old technology (1 ton aluminum per pot per day verses Hillside's 3 tons per day) and high costs (in the third quartile of global smelter costs). It probably needs to be totally re-engineered and re-built or replaced by the proposed new smelter (decision pending) at Coega on the Eastern Cape. Bayside's product is priced at the London Metal Exchange (LME) spot price plus local premiums.

¶19. (U) The Hillside smelter poured its first metal in 1996 and had a capacity of 295,000 tons per year. In 2001, this was increased to 507,000 tons and then to 705,000 tons in April 2006 by the addition of half a potline. Hillside (and Mozal) is a modern, state-of-the-art plant and is the tenth lowest cost smelter in the world (Mozal is rated the third lowest cost smelter). It is currently producing in the range of 700,000 tons per year of T-bar, billet and ingot, most of which is exported (140,000 tons to the United States and the rest to

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Europe) with a small proportion going to local fabricators and some 80-140,000 tons of liquid metal to Bayside.

¶20. (U) Hillside has two-and-a-half potlines, each requiring 400 MW of power (a total of 1,000 MW for the plant) and a total of 600 pots, each producing about three tons of aluminum per day (compared to one ton per day at Bayside). The plan is to expand production by 2010 but is dependent on the availability of a

sufficient and stable supply of power - during the past year both Bayside and Hillside smelters have had forced power interruptions. The current high demand for power has forced Hillside into a load-shedding agreement with Eskom to go off-power for one to a maximum of two hours per day during peak demand. A power outage for longer than this causes inefficiencies in production and beyond four hours could cause metal to 'freeze' in the pots. Hence rumors that BHP-B is looking to secure its own power supply - possibly a coal-fired generation plant using fine coal discards from the Richards Bay Coal Terminal. Hillside employs 1,160 permanent staff and 1,500 contractors.

¶21. (U) South Africa's conversion profile for alumina is similar to that of the western world, namely, 52% rolling products, 13% secondary smelters, 13% extrusion profiles, 11% wheel plants, 7% rods, and 4% deoxidizing products.

Semi-Fabricators and Manufacturers

¶22. (U) South Africa has four major companies that operate a number of semi-fabricating plants. These produce aluminum metal in the shapes and qualities required by downstream manufacturers. Semi-fabricators include secondary smelters that produce metal from scrap, and extruding and rolling plants that produce profiles and flat products. Further processing is carried out by a variety of downstream wheel casters, manufacturers and service providers to produce value-added finished goods.

¶23. (U) The country's major semi-fabricator is Hulett Aluminium Ltd, 60%-owned by Anglo American, South Africa's biggest and the world's fourth largest diversified mining company. Hulett owns Hulett-Hydro Extrusions, which operates two extrusion furnaces of different sizes and produces about 20,000 tons per year of profiles. Other extrusion plants in other centers produce an additional 33,000 tons per year. Hulett also owns Hulett Aluminium (Rolling), which operates the only two rolling mills in the country and produces 200,000 tons per year of hot- and cold-rolled plates and sheets. For flexibility, the plant operates seven furnaces in batch mode on a 362-day by 24-hour schedule. Hulett is located in Pietermaritzburg, the capital city of KwaZulu/Natal, and lies some 100 kilometers west of Durban. Hulett also has an extrusion plant and manufacturing facilities in Cape Town and Johannesburg.

¶24. (U) In addition to the smelters that produce metal from raw materials, South Africa has fourteen secondary smelters that produce aluminum from scrap metal. Some 60,000 tons of scrap are collected annually of which about 50% is exported and the rest melted locally. The resultant metal is of the same quality and has the same properties and uses as primary metal. Processing of scrap requires only 5% to 7% of the power input of the original metal and is therefore in great demand and fetches a high price. Consequently, the local industry has to pay international prices for scrap and would like to see government put restrictions on its export. Africa has a number of other secondary smelters located in Egypt, Ghana, Kenya, Nigeria, Tanzania, Uganda, Zambia and Zimbabwe, but only Egypt has any significant output.

¶25. (U) The production profile for value-added aluminum products produced in South Africa is 24% automotive, 24% light and heavy engineering, 21% packaging, 14% electrical, 7% deoxidizing rod and powder, 2% consumer durables, and 8% other uses. A major difference - compared to most other countries where beverage cans are entirely made from aluminum - is that in South Africa the beverage can cylinder and bottom are made of steel and only the top section is aluminum. The industry is striving to capture this very lucrative market.

Strengths and Weaknesses of the Industry

¶26. (U) The South African aluminum industry is well developed and a major contributor to the economy. During 2005, primary and semi-fabricated aluminum sales amounted to some 920,000 tons valued at about \$1.7 billion, of which exports accounted for 70% by mass and value. All plants are currently working at full

capacity and have plans to expand production after 2010 when an adequate supply of reliable power is seen as likely to be

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available. Local downstream manufacturers provide for nearly all the various market sector requirements.

¶27. (U) Additionally, local smelters provide most of the alloys required by the automotive, building and construction, engineering and fabrication, mining, packaging, and transport sectors as well as for the wheel and cable industries and a variety of other niche industries. Because of the relatively small size of the local market and wide variety of products demanded, the industry has developed the expertise to produce efficiently over short production runs.

¶28. (U) The construction of large primary metal smelters in South Africa (and the region) was predicated on the availability of a cheap and reliable supply of electric power. During the 1980's and 90's, electricity utility Eskom had a surplus of generation capacity and offered discount and risk-sharing deals to bulk users. Since early 2000, the upturn in economic activity increased electricity demand to 4% per year (from the planned 2.8%). This caused a rapid depletion of the excess capacity, to the extent that Eskom is currently battling to meet peak demand. Eskom's supply/demand safety margin is currently below 10% (desired standard is 15%) and this situation is likely to continue until new capacity (under construction) starts to kick in over the next few years. As a result, planned expansions at the three regional smelters - and filtering down to the semi-fabricators - could be delayed (or relocated elsewhere).

¶29. (U) Further weakness and threats include: cheap imports of aluminum products from China and the Far East, rising price of inputs and scrap metal, competition for new production from Australia, Jamaica and possibly Guinea, where BHP-B is negotiating the construction of a \$100 million alumina refinery project. While the ability of the South African aluminum industry to export is well developed in niche and general industry markets, the problems lies with its inability to compete on price in certain export sectors (partly due to strong Rand that prevailed until a few months ago) or to produce the volumes demanded for certain products and components. This limits the economic potential of the industry. Industry believes that real volume growth depends on exports and consequently on longer production runs in order to compete in the export market.

Future Plans for the Industry

¶30. (U) As mentioned above, the future of the aluminum industry in South Africa (and the region) depends on growth and exports. Mooted plans include the addition of a new potline at Mozal (250,000 tons), a half potline at Hillside (200,000 tons), expansion by 50,000 tons at Bayside, the possible construction of a new plant in the Eastern Cape (starting at about 250,000 tons per year), and the announced 50,000 ton expansion of the Huletts rolling plant. Smelter capacity increases will likely await the availability of guaranteed power from Eskom, which could be at a higher price.

¶31. (U) Note: On November 15, the media reported that Alcan, the world's second largest aluminum company, had concluded an electricity supply agreement with Eskom to pave the way for the establishment of a \$2.7 billion aluminum smelter at Coega in the Eastern Cape. Agreements with Eskom and the Coega Development Corporation (as landlord), will be signed next week. The project calls for the construction of a 700,000 ton per year smelter, beginning in 2008 and with first metal poured in about ¶2011. The signing will conclude the drawn-out negotiations that began with Pechiney of France at the turn of the decade and continued with Alcan after the latter's takeover of Pechiney three years ago. Financing and the ownership structure has still to be finalized. End Note.

GSP and Trade in Aluminum Products

132. (U) Hulett Aluminium Marketing Manager Lloyd Darby said their products were highly competitive in the U.S. market and that Hulett Aluminium had the option of growing this market. Although its total output was just 2% of the global market, Hulett had a market share of between 5% and 10% in some product lines. He said that the U.S. was 40% of their export market, and exports constituted roughly 70% of sales. Darby noted that the local market tended to be more profitable for them, and more advantageous in terms of lead-times, given that shipping to the U.S. generally took four weeks. Additionally, 2005 exports to Africa were less than 10% of total shipments and, according to the Aluminium Federation of SA, are unlikely to increase substantially.

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133. (U) Darby expressed concern that if South Africa was removed from the GSP program, it would have an impact on their business.

He noted that Hulett had already made representations to the Department of Commerce. Darby also said that there were no duties on processed aluminum into South Africa. Hulett, said Darby, was one of very few companies to have successfully defended an anti-dumping charge brought by Alcoa in 2004, which resulted in fines against Russian and Chinese suppliers. Alcoa later purchased the Russian firm, according to Darby.

Occupational Health and Safety

134. (U) ConJoburg personnel were able to tour both Aluminum fabrication plants in Pietermaritzburg, after donning a full set of protective gear. The fabricating plants were clean, well ventilated, and well organized, with walkways and off-limit areas clearly marked. In both plants, workers were kitted out in full protective gear, including safety glasses or visors and ear protection. Hulett-Hydro Extrusions prominently posted signs that indicated how many shifts it had managed since its last workplace accident.

135. (U) Similarly, both BHP-B smelters were immaculate with clearly defined levels of hazard by area, considerable signage on safety, and minimal human exposure to metals being processed.

All employees wore extensive safety gear, and vehicles were fitted with a variety of alarms. Bayside managers noted that the recent incursion onto the plant property by two crocodiles from a nearby wildlife preserve had posed a short-term safety hazard, until a local wildlife officer was able to remove them. Hillside managers noted that their plant, and Bayside, was highly unionized with 85% of operators belonging to either the National Union of Metalworkers South Africa (NUMSA) or to Solidarity.

HIV/AIDS and Corporate Social Responsibility programs

136. (U) Hulett-Hydro managers had no specific figures on HIV/AIDS in their facility but noted that they ran HIV/AIDS prevention campaigns and offered free ARVs. It was "not a huge problem yet", but stigmatization was an issue, and adherence to medication protocols was "not good." A manager at Hulett Aluminium also emphasized that HIV/AIDS was a significant concern, noting that they had lost a manager to the disease in the past year.

137. (U) Both Bayside and Hillside Smelters had programs in place to test and assist HIV/AIDS affected employees and assigned 1% of their profits to community projects. Hillside General Manager Gustav Griessel said that social responsibility programs were focused on clinics, schools and crhches, as well as projects encouraging job creation. Both smelters had HIV/AIDS prevalence levels of about 13% of their tested staff, and thought prevalence levels among their workers were stable although the province is believed to have the highest prevalence of HIV/AIDS in South Africa. According to Griessel, the smelters together had spent in excess of R40 million (approximate \$7 million) on community social programs over the

past several years, in addition to spending on workplace HIV/AIDs programs.

Skills Shortages

138. (U) Hulett-Hydro, which forecast 5-8% growth rates for its sector, noted the "huge" skills shortage" for industrial engineers in South Africa. Its comments were echoed by managers at Hulett Aluminium, who had recently lost a number of its engineers and managers to Australian competitors. Bayside and Hillside also confirmed that poaching by Australian competitors was having an impact on their ability to retain staff.

Environmental Impact

139. (U) Environmental controls seemed to be in place and working well. Air quality in Pietermaritzburg, where the two Hulett fabrication plants are located, appeared excellent, and managers confirmed that monitoring systems were in place. Monitoring systems were also used and publicly reported on in Richards Bay. Hillside GM Griessel noted that the agreement reached with the community prior to constructing Hillside required that total emissions of both smelters not exceed those of Bayside prior to its renovation; both smelters now produced well under Bayside's prior emissions levels. Because Hillside still had problems in meeting sulfur emissions targets, it currently imported low-sulfur pet-coke from the U.S Gulf and India.

International Aluminum

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Production of Bauxite and Alumina

140. (U) During 2005, more than 160 million tons of bauxite were mined and reserves estimated at about 23 billion tons from a resource base of 33 billion tons. Of these, some 70% of reserves and production occur in only four countries. The major deposits of bauxite are found in a wide belt around the equator. According to the USGS, the major resources are located in South America (33%), Africa (27%), Asia (17%), Oceania (13%), and elsewhere (10%). Recorded United States bauxite production was nil with reserves of 20 million tons. Major bauxite-producing countries were:

| Country | Production (tons x 1000) | Reserves (tons x 1000) |
|-----------|-----------------------------|---------------------------|
| Australia | 56 | 4,400 |
| Jamaica | 14 | 2,000 |
| Brazil | 20 | 1,900 |
| Surinam | 4 | 580 |
| Venezuela | 6 | 320 |
| Guyana | 2 | 700 |
| Guinea | 19 | 7,400 |
| India | 9 | 770 |
| China | 15 | 700 |
| Russia | 5 | 200 |
| Others | 12 | 4,300 |
| Total | 162 | 23,000 |

141. (U) While the bulk of bauxite production takes place in some five countries, global production of alumina is more widely distributed in more than 30 countries, mostly using imported bauxite. Global production for 2005 was 56.2 million tons verses plant capacity of 59.4 million tons. Production for 2006 is projected to be 63.4 million tons, an increase of nearly 13%. Regional production was from:

| Region | Alumina Production (tons x 1000) | Percent |
|----------------------|-------------------------------------|---------|
| Africa (Guinea) | 740 | 1 |
| North America | 6,930 | 12 |
| Latin America | 13,190 | 23 |
| Asia | 5,390 | 10 |
| W Europe | 6,560 | 12 |
| E and Central Europe | 5,430 | 10 |

Oceania (Australia) 17,920

32

Total 56,160

Note: Independent statistics show Chinese production (grouped under Asia above) as 8.51 billion tons.

Production of Aluminum

¶42. (U) During 2005, primary aluminum production was recorded (according to the USGS) by 44 countries. However, this number could decrease in the future as aluminum smelters, which require huge amounts of energy, could succumb to increasing fuel shortages and rising prices. Only producers with access to abundant, cheap and reliable electricity are likely to survive in a high-cost energy environment. The top ten producers accounted for 75% of the total aluminum output. Since 2001, total production has increased at an average annual rate of 7% and could exceed this for 2006. Global prices have increased by about 60% over the past two years, from \$1,700 per ton to the current \$2,700 per ton. Most smelters produce aluminum of 99.7% purity for most applications. However, a super purity product of 99.99% aluminum is used in special applications requiring high ductility or conductivity. The top eleven primary aluminum producers are:

| Country | Tons(millions) | Percent | Rank |
|---------------|----------------|---------|------|
| China | 7.80 | 24 | 1 |
| Russia | 3.65 | 11 | 2 |
| Canada | 2.89 | 9 | 3 |
| United States | 2.48 | 8 | 4 |
| Australia | 1.90 | 6 | 5 |
| Brazil | 1.50 | 5 | 6 |
| Norway | 1.37 | 4 | 7 |
| India | 0.90 | 3 | 8 |
| South Africa | 0.85 | 3 | 9 |
| Bahrain | 0.75 | 2 | 10 |
| Dubai(UAE) | 0.75 | 2 | 10 |
| Rest | 7.06 | 22 | |

¶43. (U) Note: On September 18 and 26 to 28, Labor, Minerals and Energy Officer and FSN Resource Specialist visited the Aluminium Federation of Southern Africa in Johannesburg, Hulett Aluminium Limited's semi-fabrication facilities in Pietermaritzburg, and BHP-Billiton's aluminum smelters at Richards Bay (both in KwaZulu/Natal). End Note.
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